SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT: KLIPPEL PH.D., ANKE
KAVANAUGH M.D., MIKE
HARRISON PH.D., STEVE
WILLIAMS MDPHD, LEWIS T.

(ii)   TITLE OF INVENTION: PI 3-KINASE MUTANTS AND USES
THEREOF

(iii) NUMBER OF SEQUENCES: 12
(iv) CORRESPONDENCE ADDRESS:
(A) ADDRESSEE: CHIRON CORPORATION
(B) STREET: 4560 HORTON STREET
(C) CITY: EMERYVILLE
(D) STATE: CA
(E) COUNTRY: USA
(F) ZIP: 94608

(v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30

(vi) CURRENT APPLICATION DATA:
(A) APPLICATION NUMBER:
(B) FILING DATE:
(C) CLASSIFICATION:

(viii) ATTORNEY/AGENT INFORMATION:
(A) NAME: GUTH, JOSEPH H.
(B) REGISTRATION NUMBER: 31,261
(C) REFERENCE/DOCKET NUMBER: 1201.004

(ix) TELECOMMUNICATION INFORMATION:
(A) TELEPHONE: 510-923-3888
(B) TELEFAX: 510-655-3542

(2) INFORMATION FOR SEQ ID NO:1:
(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 33 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear
(ii) MOLECULE TYPE: cDNA
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:
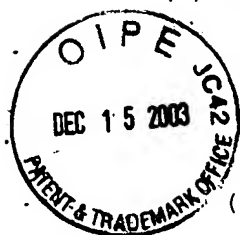GCGCCCACCA TCATCACCAC CATTGAGTCG ACG   33

(2) INFORMATION FOR SEQ ID NO:2:
(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 33 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

```
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:
GATCCGTCGA CTCAATGGTG GTGATGATGG TGG                          33


(2) INFORMATION FOR SEQ ID NO:3:
        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 5 amino acids
              (B) TYPE: amino acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: peptide
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:
         Asp Leu Gly Gly Ala
         1               5


(2) INFORMATION FOR SEQ ID NO:4:
        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 25 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:
CGTCGCCATT TCTAAAGATG ATCTC                                    25


(2) INFORMATION FOR SEQ ID NO:5:
        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 50 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:
TATGTCCCCC GTTCAGGTCC TCCTCGGAAA TCAGCTTCTG CTCATCCATT         50


(2) INFORMATION FOR SEQ ID NO:6:
        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 52 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:
CTAGAATGGA TGAGCAGAAG CTGATTTCCG AGGAGGACCT GAACGGGGGA CA       52


(2) INFORMATION FOR SEQ ID NO:7:
        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 10 amino acids
              (B) TYPE: amino acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: peptide
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:
         Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
         1               5                   10


(2) INFORMATION FOR SEQ ID NO:8:
```

```
        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 90 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:
GCATTCTCAC ATGATCACGC ACTTGGTCTT GGACTTCTTC TTCTTCTTTT TGCCATCTTT    60
GGAGGCGCCG AGCTCGTTCA AAGCATCCTG                                      90


(2) INFORMATION FOR SEQ ID NO:9:
        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 81 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:
GGATCCTCAG CTCAGCACGC ACTTGCAGCT CATGCAGCCG GGGCCGCTGC TGGCGCCCCC    60
GAGCTCGTTC AAAGCATGCT G                                               81


(2) INFORMATION FOR SEQ ID NO:10:
        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 18 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:
CTGAGCAAGA AGCTTTGG                                                   18


(2) INFORMATION FOR SEQ ID NO:11:
        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 46 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:
TATGTCCCCC GCGCTGGCTG GGGTCCTTGG TCGTCTTGCT GCTCCC                    46


(2) INFORMATION FOR SEQ ID NO:12:
        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 51 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear
        (ii) MOLECULE TYPE: cDNA
        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:
CATGGGGAGC AGCAAGAGCA AGCCCAAGGA CCCCAGCCAG CGCGGGGGAC A              51
```